



قسم الجيولوجيا



جامعة جنوب الوادي

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# **Practical course**

## **Geology (3)**

### **Structural Geology & Geomorphology**

3<sup>rd</sup> year Geology-Biology, Faculty of Education

**Prepared by**

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**(2021/2022)**

## Basic information

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**Faculty:** Education

**Class:** 3<sup>rd</sup> year

**Specialization:** Geology-Biology

**Pages:** 112

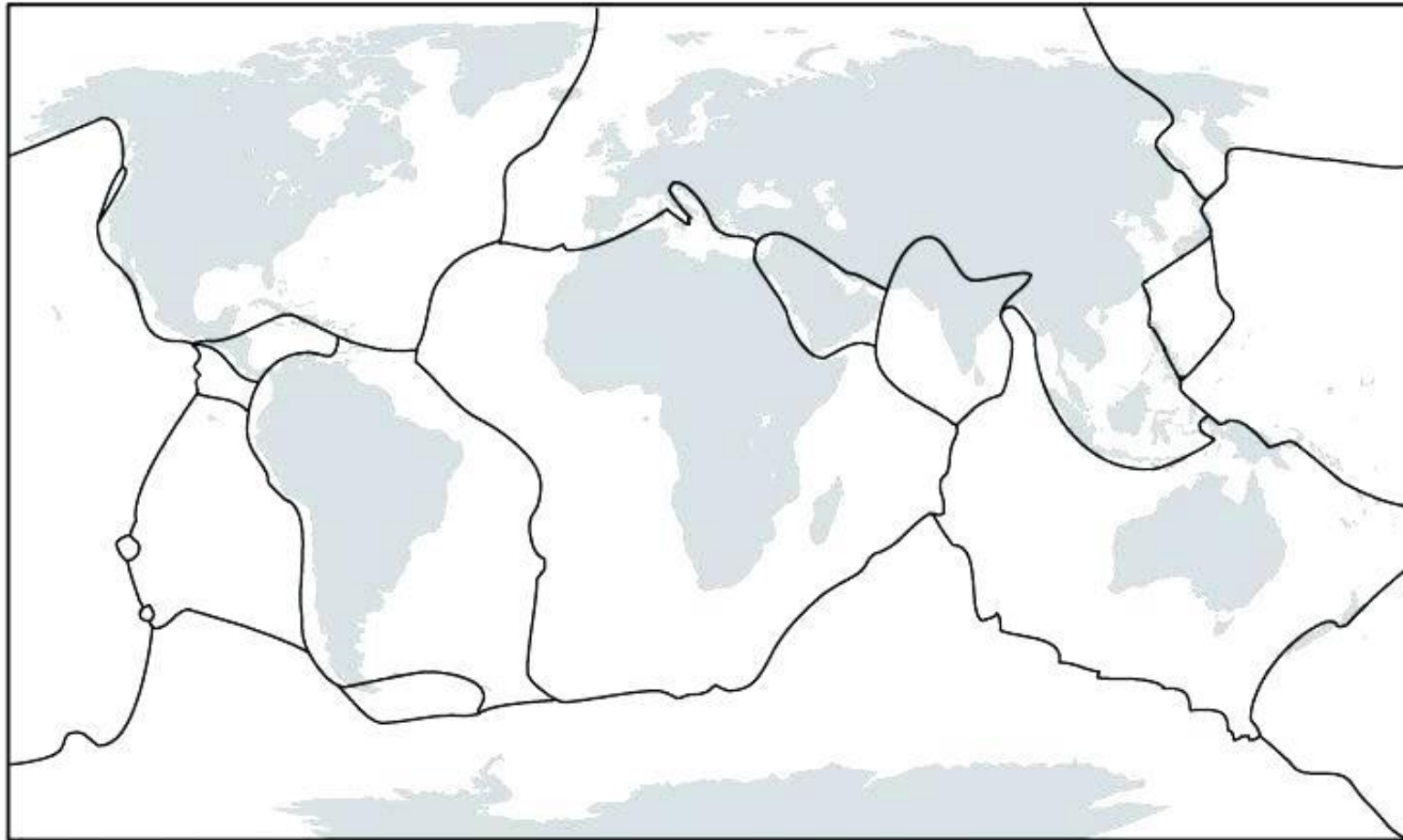
**Department:** Geology-Biology Department

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## Problem # 1: Plate Tectonics

### Tectonic Plates





\* Number (or colour code) the tectonic plates listed below, then label them (or colour them) on the map.

- |   |   |   |   |                                       |
|---|---|---|---|---------------------------------------|
| <input type="checkbox"/> Pacific Plate  | <input type="checkbox"/> Arabian Plate    | <input type="checkbox"/> North American Plate | <input type="checkbox"/> Indian Plate     | <input type="checkbox"/> Nazca Plate  |
| <input type="checkbox"/> African Plate  | <input type="checkbox"/> Australian Plate | <input type="checkbox"/> South American Plate | <input type="checkbox"/> Antarctic Plate  | <input type="checkbox"/> Cocos Plate  |
| <input type="checkbox"/> Eurasian Plate | <input type="checkbox"/> Caribbean Plate  | <input type="checkbox"/> Juan de Fuca Plate   | <input type="checkbox"/> Philippine Plate | <input type="checkbox"/> Scotia Plate |

## Geologic Time

The geologic time scale must be understood for proper evaluation of geologic structures. Stratigraphic codes utilize the time scale to indicate the relative ages of strata.

Young	Period	Symbol	Young	Period	Symbol
	Quaternary	Q		Mississippian	M
	Tertiary	T		Devonian	D
	Cretaceous	K		Silurian	S
	Jurassic	J		Ordovician	O
	Triassic	Tr		Cambrian	-C
	Permian	P		Precambrian	p-C
	Pennsylvanian	P			
	Old				

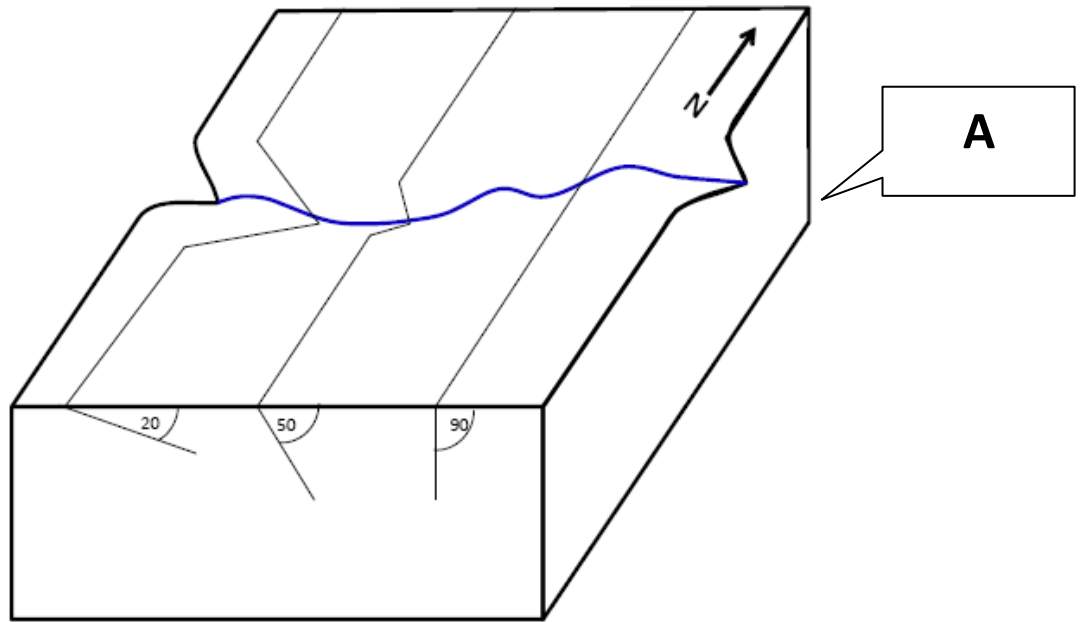
(B) Stratigraphic codes such as “Oc” on a geologic map may mark the exposed area of the Ordovician age Chickamauga Formation. The geologic period abbreviation is always uppercase, whereas the formation name abbreviation is lowercase. Note the special symbols for Precambrian, Cambrian, Pennsylvanian, and Triassic.

### X. Rule of “V” for Geologic Contacts

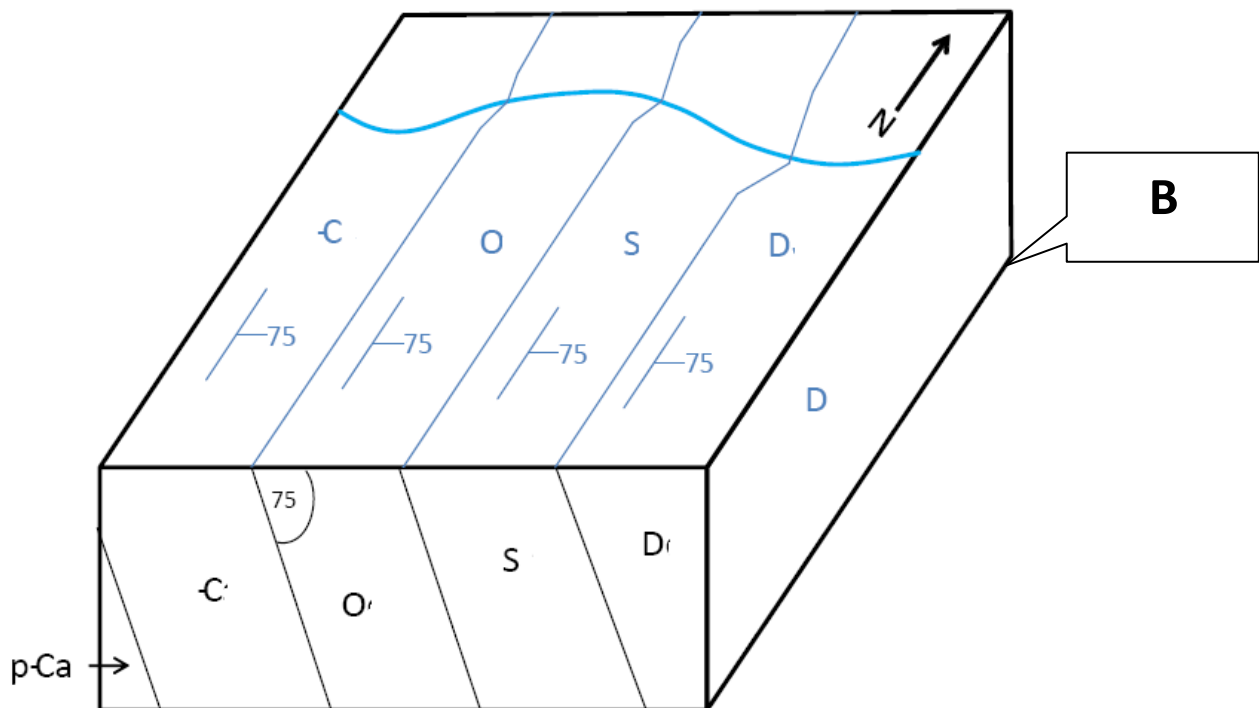
(A) When inclined beds cross a stream valley the contact will form a “V” pointing in the dip direction.

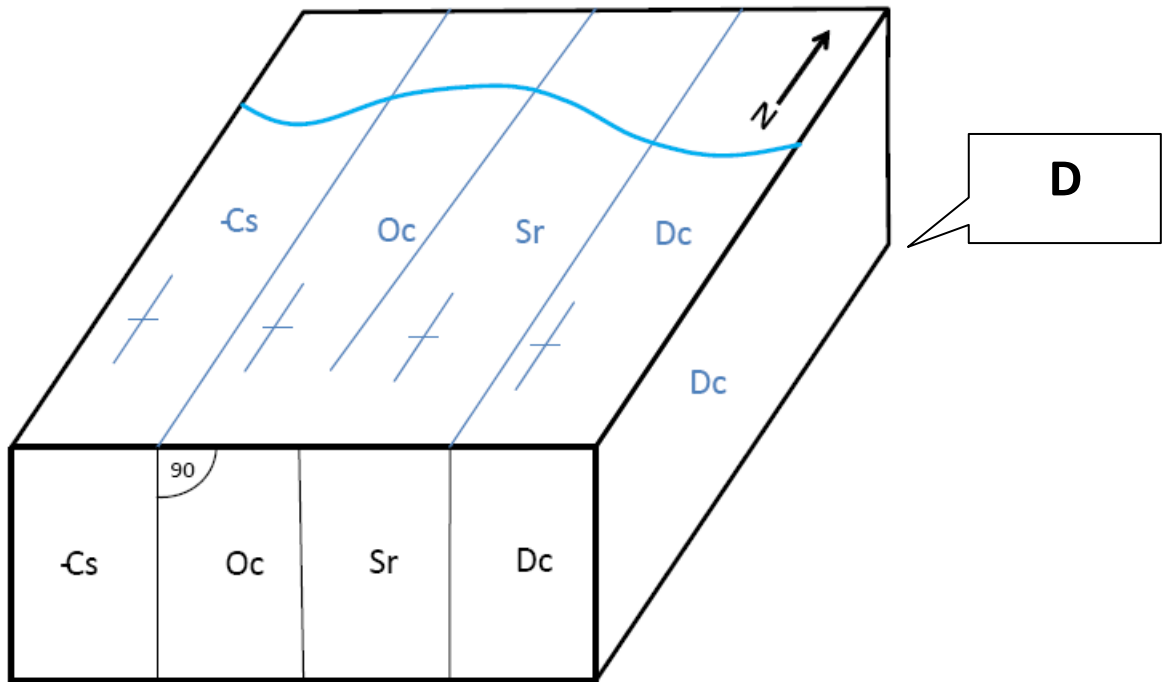
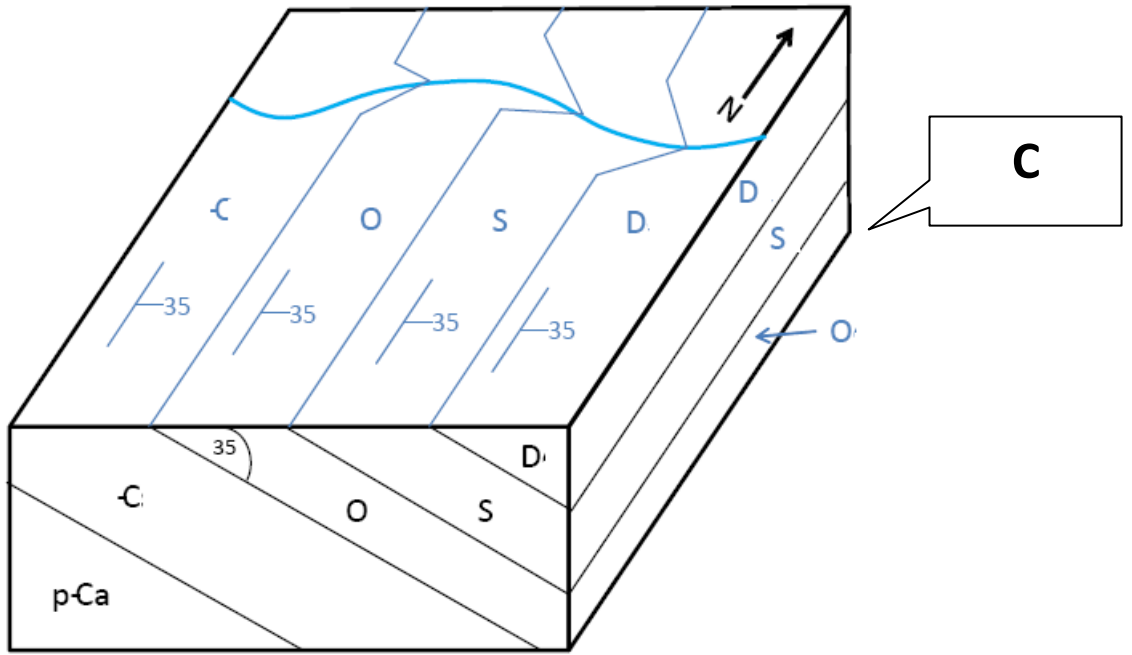
(B) The “V” shape is more pronounced with shallow dips, less so as the dip angle increases.

**Problem #2:** Describe strike and dip direction of the given bedding and which unit is the youngest? Compare between the dipping of strata?

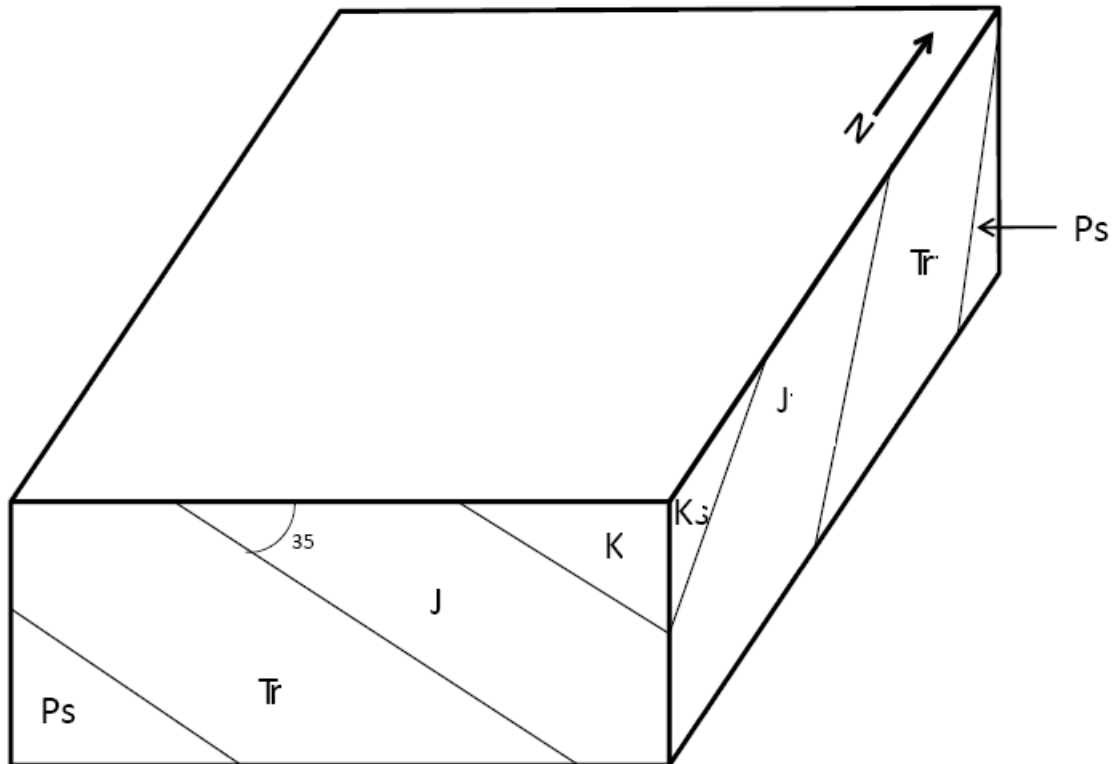


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**Problem #3:** Using the block diagram add relevant information to the map surface portion of the block diagram. Include strike and dip symbols in each stratigraphic unit on the map surface. Label each stratigraphic unit with the proper abbreviation. Write a geologic report.



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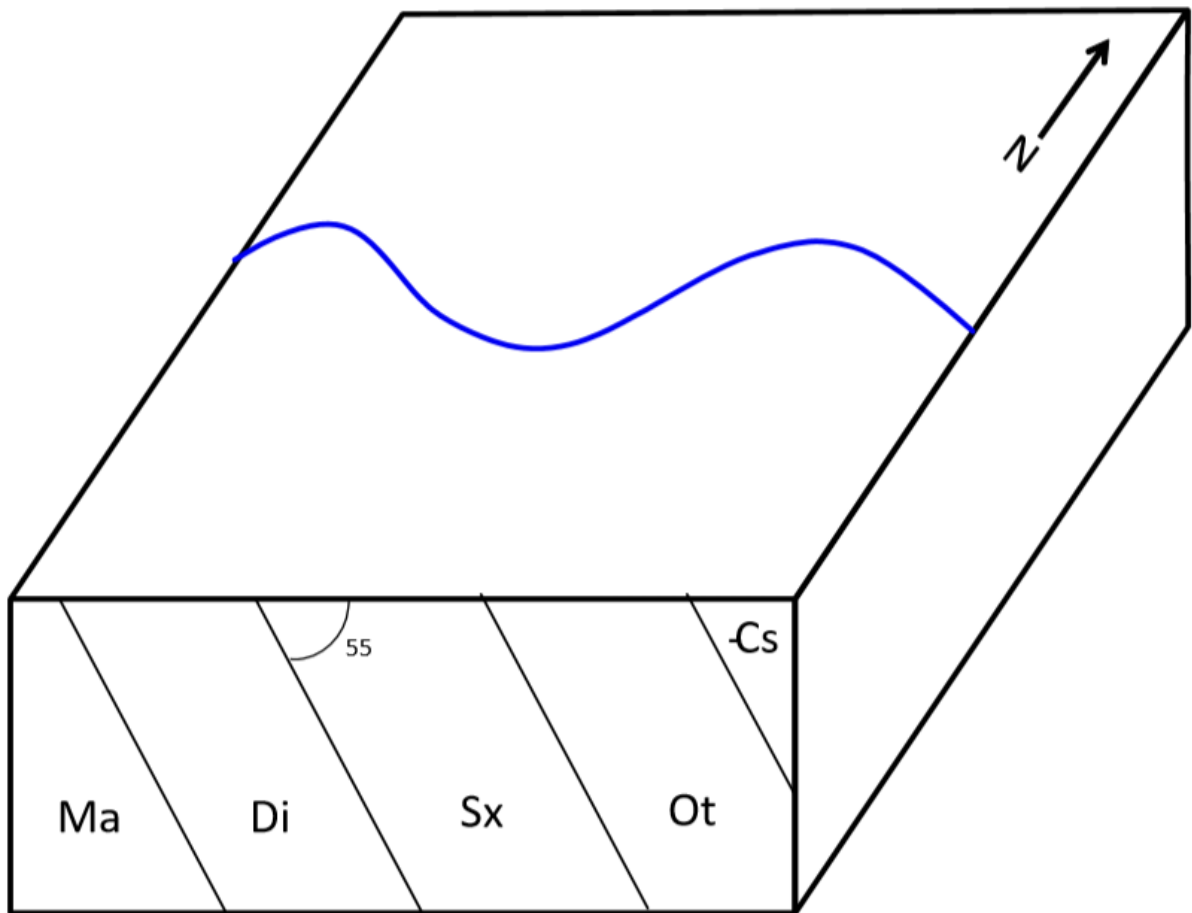
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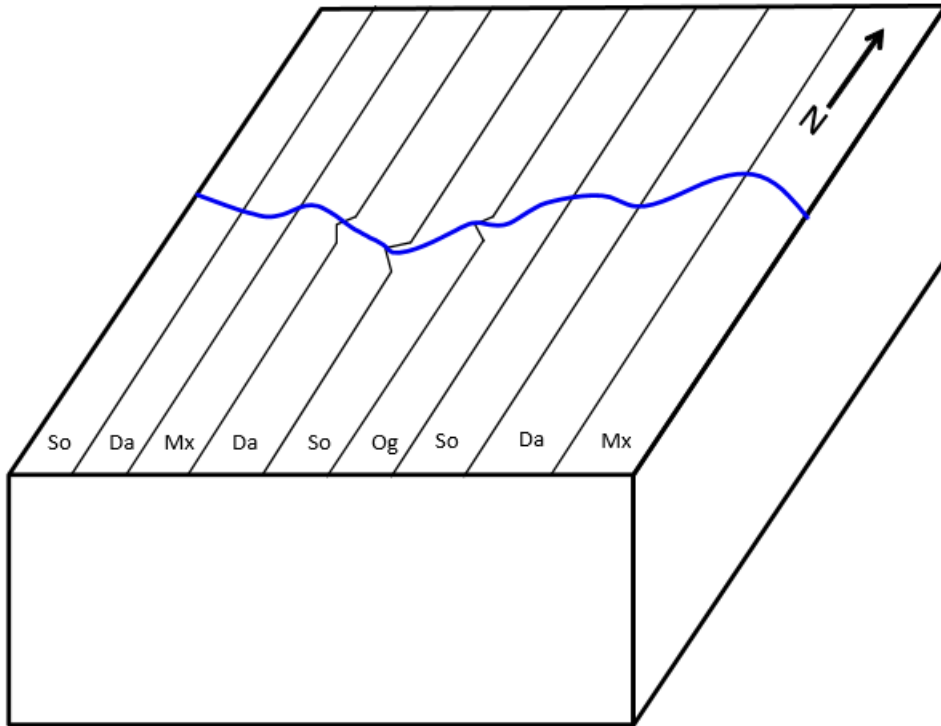
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**Problem #4:** Using the block diagram add relevant information to the map surface portion of the block diagram. Include strike and dip symbols in each stratigraphic unit on the map surface. Label each stratigraphic unit with the proper abbreviation. Write a geologic report.





**Problem #5:** Complete all visible sides to the block diagram, and add strike and dip symbols, abbreviations, and fold axial trace symbols to the map surface. Note the stream on the map surface.



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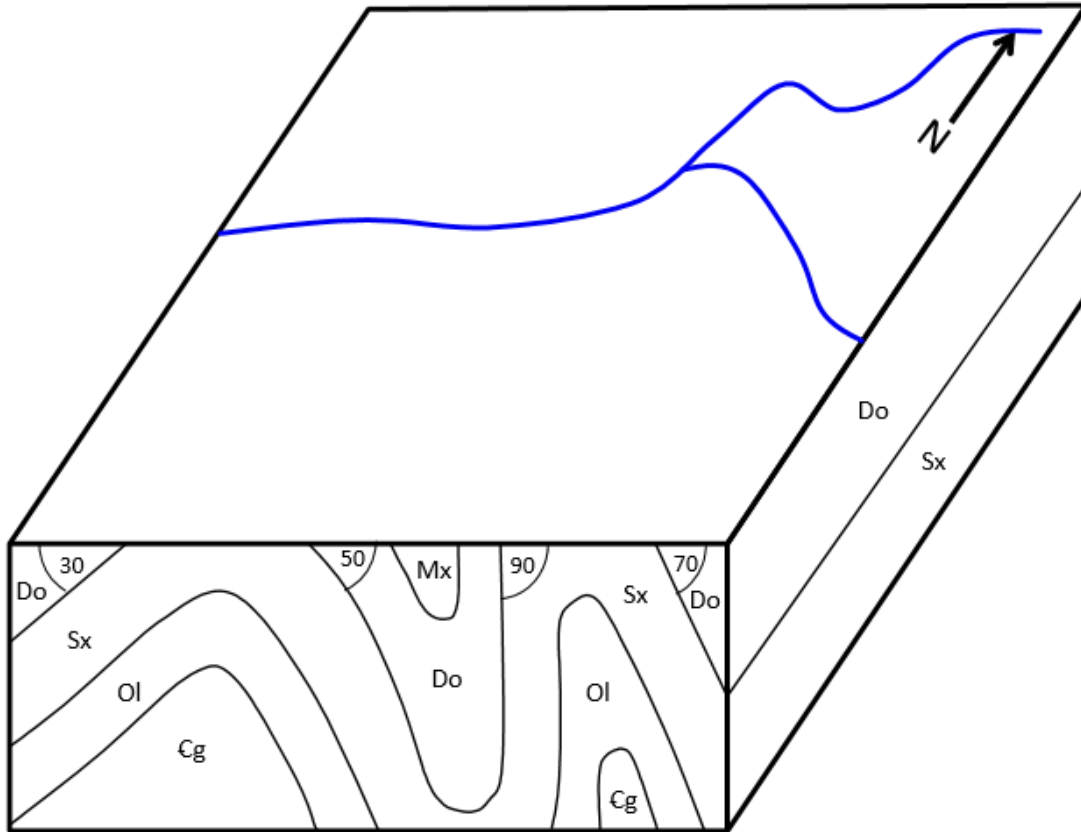
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**Problem #6:** Complete the block diagram. Add strike and dip symbols, unit abbreviations, and fold axial trace symbols to the map surface. Note the stream on the map surface.



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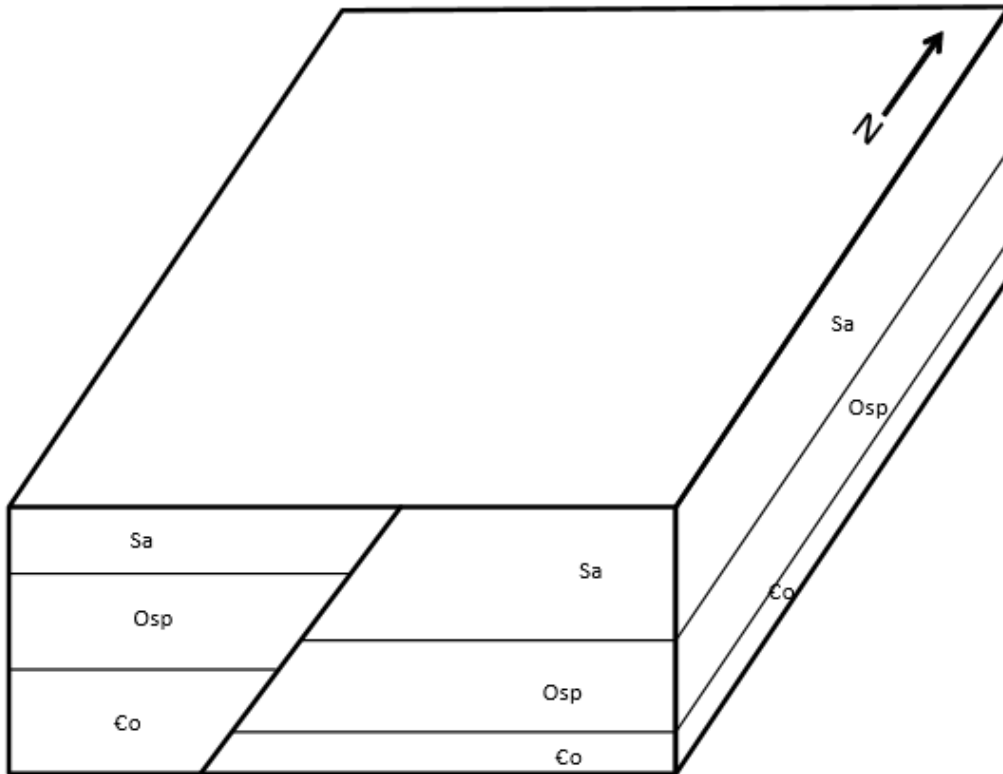
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**Problem #7:** Complete the block diagram. Complete all visible sides to the block diagram, and add strike and dip symbols to the map surface. Add appropriate fault symbols and label strata with age labels. Write the fault

Fault Classification: \_\_\_\_\_



classification in the upper left corner.

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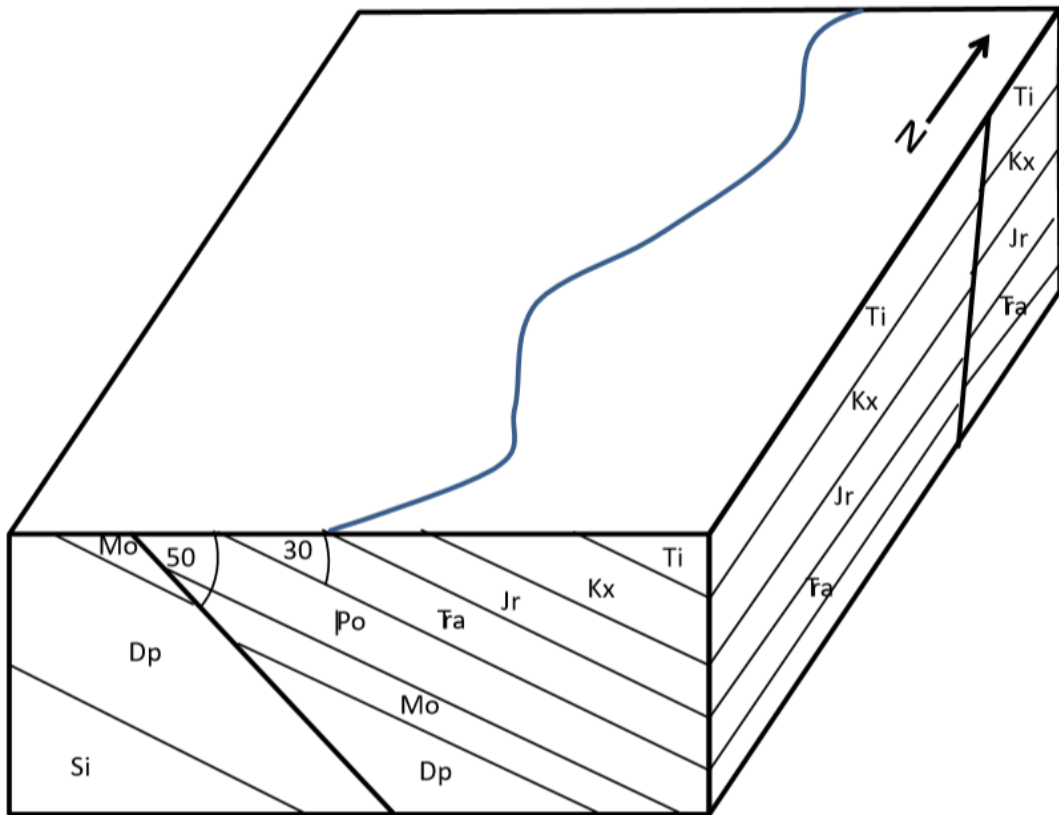
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**Problem #8:** Complete the block diagram. Complete all visible sides to the block diagram, and add strike and dip symbols to the map surface. Add appropriate fault symbols and label strata with age labels. Write the fault classification in the upper left corner.

Fault Classification: \_\_\_\_\_



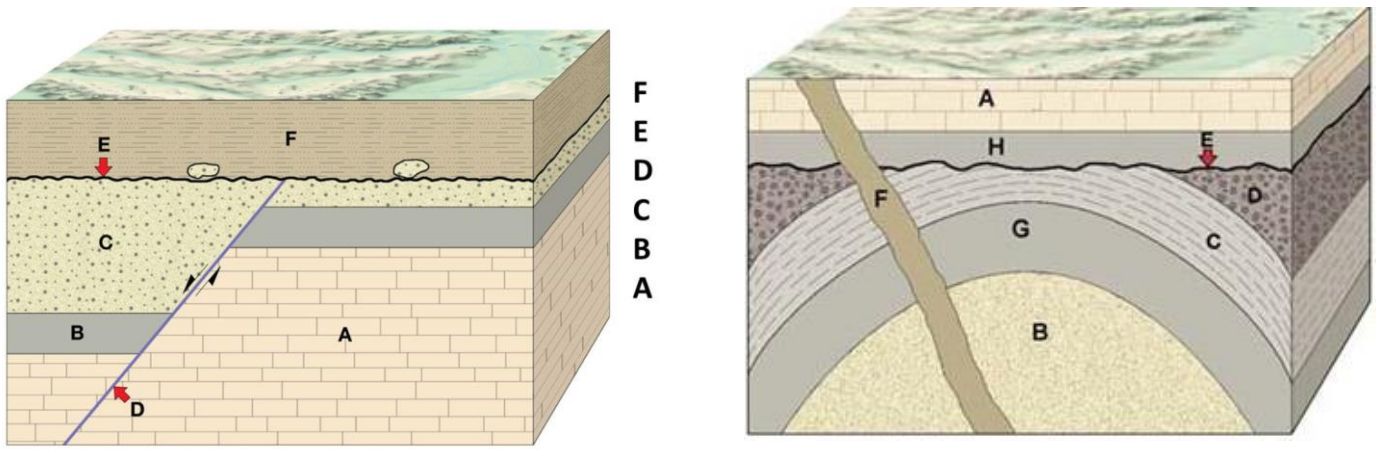
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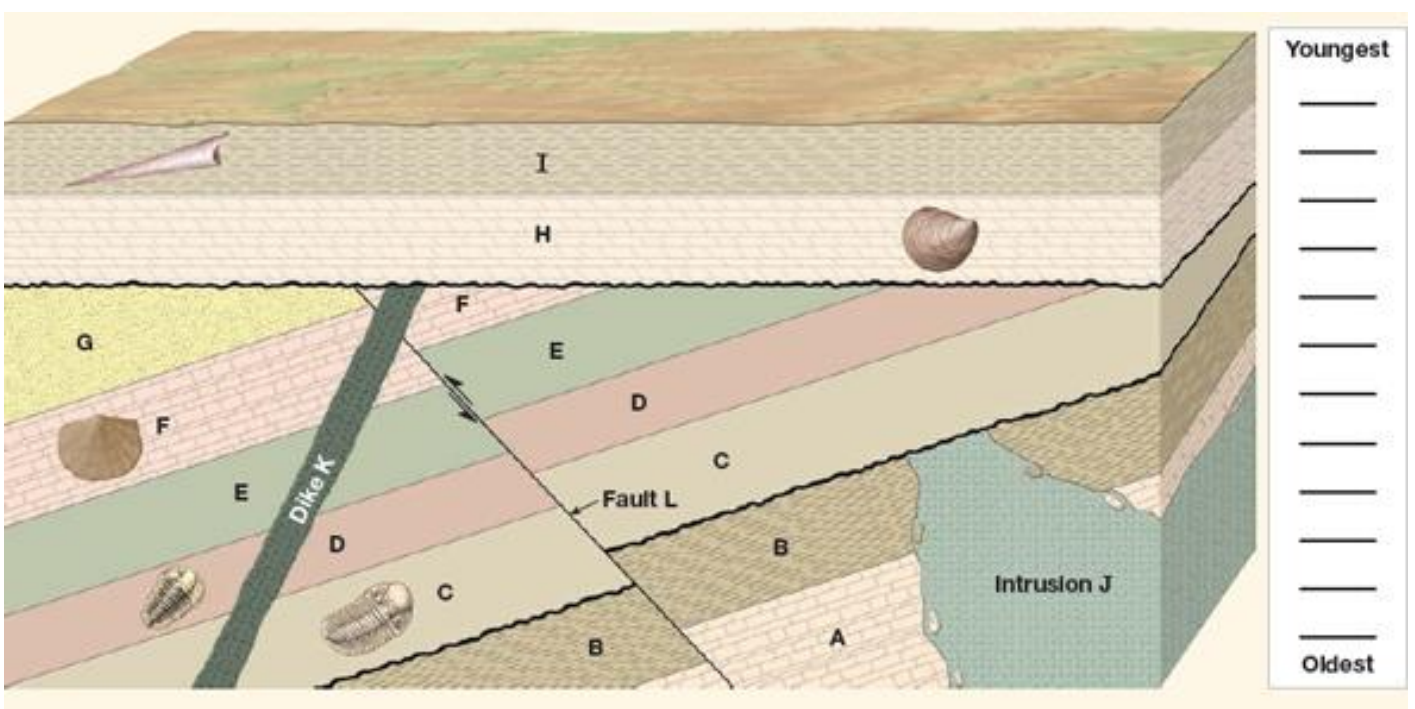
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**Problem #9:** Using the block diagrams, label each geologic structures and write a geologic report.



**Problem #10:** Using the cross-section, label each geologic structures, order the geologic events and write a geologic report.















**Problem# 13: Use the sketch map to answer questions 1 to 3.**

**1- The geological fold structure exposed in the map area above is a**  
 plunging anticline.    plunging syncline.    B. A.  
 non-plunging syncline.    D. non-plunging anticline.    C.

**2. Use the sketch map to answer this question. The structural symbol that should be placed at X is.(c is correct)**

- A.                       B. 
- C.                       D. 

**3. Use the sketch map to answer this question. The fault shown in the map area above is a**

- D. strike-slip fault.    B. normal fault.    C. reverse fault. thrust fault.    A.





**4. Fault F would be classified as**

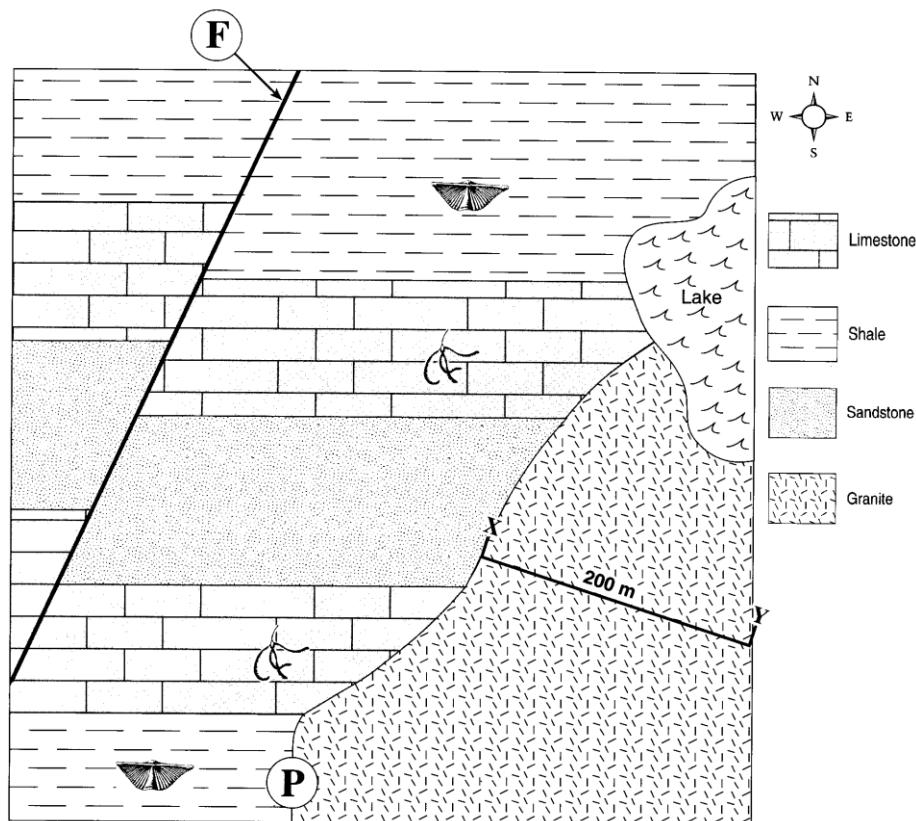
- B. normal.                      thrust.    A.  
 D. strike                      reverse.    C.  
 slip.

**5. Use the Geological map together with the Geologic Time Scale to answer this question. The graptolites are Silurian and the Brachiopod is Devonian. What is the name of the fold, which has affected the sedimentary rocks?**

- B.    Syncline.    A.  
 Anticline.  
 Plunging syncline.    D.    C.  
 Plunging anticline.

**6- The contact between the granite and the shale at position P is dipping to the west. The correct strike and dip symbol for the contact at position P is (c....)**

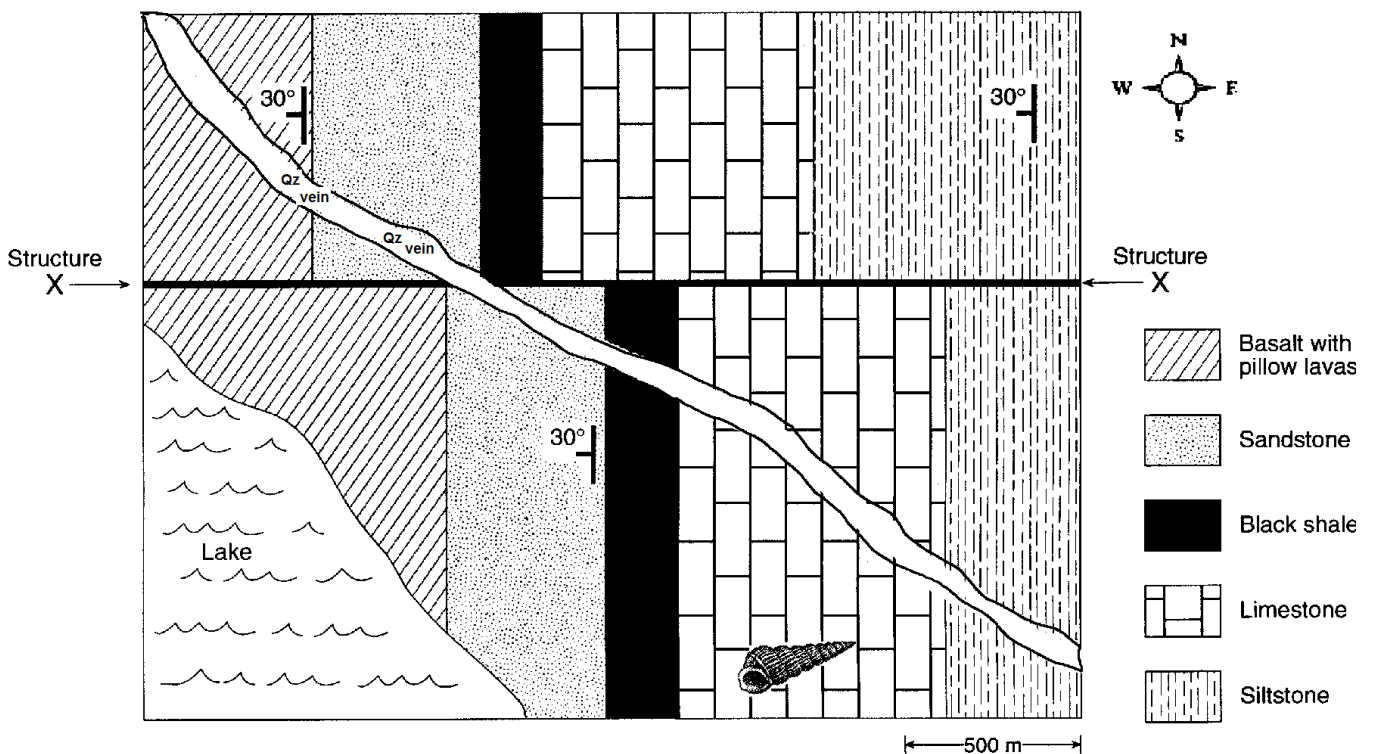
- A.                       B. 
- C.                       D. 



**Problem #14: Use the Geological Time Scale, Fossil Samples and the Geological Map to answer the following questions:**

**1. The orientation of the strata shown on the Geological Map is**

- A. strike east, dip 30 degrees north.
- B. strike south, dip 30 degrees east.
- C. strike north, dip 30 degrees west.
- D. strike west, dip 30 degrees south.



**2. The movement along structure X on the Geological Map is entirely vertical. Structure X is most likely a**

- A. joint.    B. dip-slip fault.
- C. unconformity.    D. strike-slip fault.

**3- Qz vein occurs along.....**

- (a) fault plane    (b) joint    (c) fold

**4- Qz vein mostly refers to .....**

- (a) longitudinal structure    (b) diagonal structure    (c) orthogonal structure
- (d) dip structure

**Problem #15:** Finalize Cardboard Model 1: First, complete the north and east sides of the block. On the geologic map, draw strikes and dip symbols to indicate the orientations of formation E at points I, II, III, and IV. On the map at the top of the model, draw the proper symbol along the axis of the fold.

